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132. Proposed by G. B. M. ZERR, A. M., Ph. D., Professor of Chemistry and Physics, The Temple College, Philadelphia, Pa.

$n$  points are taken at random on the circumference of a given circle. Prove that the chance of the center of the circle lying within the polygon formed by joining these points is  $1 - (1/2^{n-2})$ .

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### MISCELLANEOUS.

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128. Proposed by J. E. SANDERS, Hackney, Ohio.

The sides of a trapezium are  $a=20$ ,  $b=32$ ,  $c=40$ , and  $d=36$ . If  $c$  is opposite  $a$ , and the diagonals equal, what is the length of either diagonal?

129. Proposed by J. SCHEFFER, A. M., Hagerstown, Md.

How high above the surface of the earth must an observer be elevated at the latitude  $\phi (=39^\circ 19')$ , the declination of the sun being  $\delta (=23^\circ 27')$ , in order to see the sun at midnight?

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### NOTES.

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Professor A. G. Greenhill was awarded by the London Mathematical Society its De Morgan Medal for 1902.

Professor W. H. Metzler, of Syracuse University, has been made Fellow of the Royal Society of Edinburgh.

Professor L. L. Locke has been elected Professor of Mathematics in Adelphi College, Brooklyn, New York.

Professor I. L. Fuchs, Professor of Mathematics in the University of Berlin since 1884, and of late editor of *Crelle's Journal*, died April 26th, at the age of sixty-eight years.

Dr. Charles W. M. Black, Instructor in Mathematics in the University of Oregon, and a contributor to the MONTHLY during the first two or three years of its publication, died August 11, at La Grande, Oregon.

Professors Ormond Stone, of the University of Virginia, E. H. Moore, of the University of Chicago, and Frank Morley, of Johns Hopkins University, have been appointed by the executive committee of the Carnegie Institution, as advisors in relation to original research in mathematics.

On July 6th occurred the death of William Lee Harvey, of Portland, Me. Mr. Harvey was born at Maxfield, Me., November 18, 1825. He was born and raised on a farm in the backwoods of Maine, and in his early years had only the advantages of the district schools of that day. He managed to spend a few terms in an academy and thus prepared himself for teaching in the common schools. While in school he acquired a taste for mathematics, and studied and

pretty thoroughly mastered algebra, geometry, trigonometry, and the calculus, without a teacher, using as texts Bonycastle, Hutton, Young, and Peirce. As a problem-solver, Mr. Harvey ranked high, as many of his solutions of difficult problems proposed in the various mathematical journals of the country will show. He has in his library some rare works on mathematics, all of which are offered for sale. Persons interested in securing rare mathematical works should write to Mrs. Harvey, Portland, Me.

Since the last issue of the MONTHLY one of its loyal friends and supporters has been removed from among the great body of American mathematicians. On July 8th, occurred the death of Professor John D. Runkle, Professor of Mathematics in the Massachusetts Institute of Technology. Professor Runkle was a substantial friend of the MONTHLY from the beginning, and we shall greatly miss him. In the last letter we received from him, among other things, he said, "Please find enclosed my check for \$5 in payment of my subscription to the MONTHLY for the current year. I am glad to make this small voluntary contribution to help you in your difficult work, for I know, by experience, how hard it is to maintain the publication of a mathematical journal in this country. You are doing a good work." Professor Runkle's experience with mathematical journalism was with the *Mathematical Monthly* which was founded by him in 1858 and which he edited and published for three years, at the end of which time it was discontinued for lack of proper support. We hope in a future number to publish a biographical sketch of Professor Runkle.

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### BOOKS AND PERIODICALS.

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*The Foundations of Geometry.* By David Hilbert, Ph. D., Professor of Mathematics, University of Göttingen. Authorized Translation by E. J. Townsend, Ph. D., University of Illinois. 8vo. Cloth, 132 pages. Price, \$1.00 Chicago: The Open Court Publishing Co.

In this work Professor Hilbert attempts "to choose for geometry a *simple and complete* set of independent axioms and to deduce from these the most important geometrical theorems in such a manner as to bring out as clearly as possible the significance of the different groups of axioms and the scope of the conclusions to be derived from the individual axioms."

He begins by considering *three* systems of things which he calls *points, straight lines, and planes*, and sets up a system of axioms connecting these things in their mutual relations. The axioms he arranges in five groups. These are I. 1—7. Axioms of *connection*; II. 1—5. Axioms of *order*; III. Axioms of *parallels* (Euclid's axiom); IV. 1—6. Axioms of *congruence*; V. Axiom of *continuity* (Archimedes' axiom). He then discusses the relations of these axioms to one another and also the bearing of each upon the logical development of Euclidean Geometry. With these axioms, Professor Hilbert arrives at many important results. The dependence of some of Professor Hilbert's axioms on others has been referred to in a previous issue of the MONTHLY. The work is not only of great mathematical value, but it is also of great importance from the pedagogical standpoint to the teacher of mathematics. Every teacher of geometry should carefully study this book. B. F. F.